

Implementation Strategy and Priorities for Bay Delta
Ecosystem Restoration
Report to the Ecosystem Roundtable

I. *INTRODUCTION*

The mission of the CALFED Bay-Delta Program (CALFED) is to develop a long term comprehensive plan to restore ecosystem health and improve water management for beneficial uses of the Bay-Delta System. CALFED's Ecosystem Restoration Program goal is to "improve and increase aquatic and terrestrial habitats and improve ecosystem functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species". The Ecosystem Restoration Program Plan (ERPP) is still in the development stage, however basic restoration objectives have been agreed upon.

With the passage of Proposition 204, state funding is now available to augment stakeholder contributions to Category III. Stakeholders have agreed that Category III actions should be consistent with CALFED and ERPP. Therefore, restoration priorities need to be established for the allocation of those funds which are consistent with the objectives of the ERPP. On December 13, 1996 the Ecosystem Roundtable tentatively recommended that the priorities for allocating ecosystem restoration resources should be (1) aquatic species that are listed, of special concern, or desirable and in "greatest need", and (2) habitat types that have experienced the greatest decline, and which are important to the priority species. The Roundtable emphasized an interest in funding habitat demonstration projects that can increase the understanding of large scale ecosystem restoration processes. Using the ERPP as a guiding document, this draft paper identifies the rationale for setting near term restoration priorities, and then identifies the restoration priorities based on that rationale. Criteria are also included that will help guide selection of actions to address the priority species and habitat types.

II. RATIONALE FOR IDENTIFYING NEAR-TERM RESTORATION PRIORITIES

The rationale that were used to select species and habitat types is as follows:

- CALFED Mission. Focus on species and habitat whose restoration will result in the greatest progress towards achieving the CALFED mission to restore ecological health and improve water management for beneficial uses of the Bay-Delta System. Aquatic fish species, and habitats supporting aquatic fish species would be priorities based on this criteria.
- High Risk. Focus of species and habitat at high risk--listed species and habitats in decline.
- Ecosystem Benefits. Focus on habitats that provides the broadest ecosystem benefits and benefits to high priority species.

III. HABITATS

Habitat types that have experienced the greatest declines and which provide the broadest ecosystem benefits and/or benefits, to the priority species include the following:

1. *Tidal perennial aquatic habitat (freshwater).*

Description. Includes shallow aquatic habitats, particularly less than 9 feet deep from mean high tide.

Priority rationale: This habitat type has declined dramatically in the delta. It provides habitat for many fish and wildlife species, and contributes to the primary and secondary productivity of the foodweb in the Delta. Implementation of pilot projects would allow restoration techniques to be refined. Experience restoring this type of habitat has been limited and there are several key questions related to benefits it may provide for salmon rearing in the delta that need to be answered as part of the larger ERPP.

Examples: Projects already underway include Prospect Island.

Key species: Delta smelt, salmon, wildlife and plant species in the following guilds: shorebird and wading-bird guild, waterfowl guild, freshwater emergent wetlands plant association.

2. ***Seasonal wetland and aquatic (emphasis on seasonal floodplain habitat)***

Description: Includes habitat within the floodplain which is inundated seasonally during high flood water.

Priority rationale: This habitat type provides seasonal habitat for aquatic species such as splittail spawning and salmon rearing and for wildlife species such as waterfowl and shorebirds. It also provides functions such as nutrient cycling and foodweb support. Seasonal floodplain habitat have been greatly reduced by levee construction and changes in hydrology. Restoration of seasonal floodplain habitat can also provide opportunities for riparian forest restoration using natural processes in some locations if conflicts with flood control can be avoided. There is a large body of knowledge regarding restoration of fairly intensively managed seasonal wetlands, but there is relatively little expertise available on the technique of using natural floodplain processes to restore wetlands. There are also questions related to feasibility and interactions with flood control operations that could be addressed through pilot projects.

Examples: The Yolo Bypass, the Nature Conservancy's restoration project on the Cosumnes River Preserve, and Stone Lakes Wildlife Refuge.

Key species: salmon, splittail, waterfowl and wading birds, giant garter snakes, and for the areas where riparian restoration can accompany seasonal floodplain wetlands, species such as western yellow-billed cuckoo, Swainson's hawk, riparian wildlife guild, and neotropical migratory bird guild.

3. ***Shaded riverine aquatic habitat***

Description: Includes riparian habitat adjacent to or overhanging streams and rivers.

Priority rationale: This habitat type provides food and escape cover for outmigrating salmonid juveniles and is an important source of nutrients in the streams and delta sloughs. Much of this habitat type along the major rivers and in the delta has been lost due to river channelization and levee construction and maintenance. Shaded riverine aquatic habitat can be restored in two ways, through restoration on existing levee berms and through restoration of natural processes by modifying flood control facilities such as with levee setbacks. In giving this habitat type priority, the focus should be on restoration using natural river processes with habitat restoration on existing levee berms occurring only where natural process restoration is precluded.

Examples: Sacramento River Refuge/SB 1086, Cosumnes River Preserve

Key species: Salmonids, other riparian dependent species.

4. ***Saline emergent wetlands (tidal)***

Description: Includes tidal brackish and saltwater wetlands.

Priority rationale: This habitat type supports several listed plant and animal species and is important for nutrient cycling and foodweb support functions. It has also declined due to diking and reclamation of bay lands.

Examples: There are several restoration projects in the North Bay and Suisun Bay.

Key species: Salt marsh harvest mouse, Suisun song sparrow, California clapper rail, and for some of the restoration projects in the North Bay which restore natural salinity gradients at creek mouths, this type of restoration can be important for aquatic species such as splittail and striped bass.

5. ***Midchannel islands and shoals***

Description: Includes the channel islands in the Delta.

Priority rationale: These midchannel islands actually represent several habitat types including shoals, tidal mudflats, tule marshes, shaded riverine aquatic, and

riparian scrub habitat. They are a high priority for protection and restoration because of the diversity of habitat they provide and because they continue to be threatened. They are one of the few habitat areas in many areas of the delta where habitat restoration opportunities have not been complicated by subsidence.

Examples: Staten Island midchannel island project

Key species: Delta smelt, salmon, shore bird and wading-bird guilds, and waterfowl guild.

6. ***Agricultural wetlands and Perennial grasslands***

Two other habitat types in the north delta, agricultural wetlands and perennial grassland, may also need to be included because these habitat types in this area currently provide foraging habitat for waterfowl, Swainson's hawks, and sandhill cranes and can also provide opportunities for restoration of seasonal floodplains and tidal perennial aquatic habitat because of the limited amount of subsidence that has occurred. These habitat types in the north delta are rapidly being converted to vineyards which could preclude opportunities for restoration in the future.

IV. **KEY SPECIES OR POPULATIONS**

Species or populations that are at the greatest risk of decline and whose recovery contributes the greatest to the CALFED mission includes the following aquatic species that are listed, are being considered or are likely to be considered for listing, or aquatic species such as striped bass that are linked to water quality standards:

- San Joaquin River fall run chinook salmon
- Winter-run chinook salmon
- Spring-run chinook salmon
- Delta smelt

- Splittail
- Steelhead trout
- Green sturgeon
- Striped bass

1. **San Joaquin River fall-run chinook salmon:** The chinook salmon is an important native anadromous sport and commercial fish with important ecological value. The fall-run race on the San Joaquin River is designated as a species of concern by USFWS.
2. **Winter-run chinook salmon:** The chinook salmon is an important native anadromous sport and commercial fish with important ecological value. The winter-run race is listed as endangered under the state and federal Endangered Species Acts.
3. **Spring-run chinook salmon:** The chinook salmon is an important native anadromous sport and commercial fish with important ecological value. The spring-run race on the Sacramento River is designated as a closely monitored species by DFG and a species of concern by USFWS.
4. **Delta smelt:** The delta smelt is a native estuarine resident fish that has been listed as threatened under the state and federal Endangered Species Acts.
5. **Splittail:** The Sacramento splittail is a native resident fish that is proposed for listing under the federal Endangered Species Act and a candidate for listing under the State Endangered Species Act. The Sacramento splittail also supports a small winter sport fishery in the lower Sacramento River.
6. **Steelhead trout:** The steelhead trout is an important native anadromous sport fish of high recreational and ecological value that is proposed for listing under the federal Endangered Species Act.
7. **Green sturgeon:** The green sturgeon is designated as a species of special concern by DFG and a species of concern by USFWS.
8. **Striped bass:** The striped bass is an important non-native anadromous sport fish with high recreational value. It also plays an important role as a top predator in the aquatic system.

V. PHYSICAL AND ECOSYSTEM PROCESSES

The CALFED ERPP is based on the premise that ecological processes and functions are a fundamental basis of successful ecosystem restoration. These natural processes serve to create

and maintain habitats needed by fish, wildlife and plant communities. Restoration efforts based on restoration of natural processes are likely to be more cost effective in the long term because they should be self sustaining and require less human intervention. This premise will also be a basis for the early implementation program.

As watersheds are evaluated to identify limiting factors which may be affecting the priority species, they will be evaluated to determine the status of important ecological processes and functions. Where these processes have been interrupted or altered so the needed habitats are no longer being provided, the feasibility of restoring those processes will be evaluated. If the processes can be restored through early implementation actions, those actions will be given preference. Where it is not feasible in the short term to restore the natural process, care will be taken to ensure that short term restoration actions do not preclude long term restoration of the processes. Where it is clear that the natural process cannot be restored, it may be necessary to take restoration actions that replace or supplement the natural process, knowing that these will be on-going annual maintenance types of programs. For example, if a major diversion blocks the only source of sediment to a salmon spawning area and it is not feasible to restore gravel recruitment through channel meandering due to urban encroachment, it may be necessary to regularly place gravel in the system.

VI. GEOGRAPHIC DISTRIBUTION OF PRIORITIES

The geographic distribution of the five habitat types and the eight species or populations priorities are shown in Table 1 and 2. Using these habitat types and species as priorities will result in a fairly broad geographic distribution of projects and resources. Therefore, no additional geographic priorities have been established at this time.

Some areas like the Feather River or the North Bay would logically receive less funding and projects than areas such as the delta or the mainstem Sacramento where projects could provide multiple benefits. Smaller tributaries to the Sacramento River which do not support spring run would have resources allocated to them only if they could provide a solution for a problem in the Sacramento River itself. For example, some of the smaller tributaries are important sources of gravel recruitment to the mainstem and so the technical teams could identify actions to maintain or improve this gravel supply if necessary.

Table 1. Geographic Distribution of Priority Habitat Types						
	North Bay	Delta	Sacramento	Sacramento Tributaries	San Joaquin	San Joaquin Tributaries
Tidal Freshwater		x				
Seasonal floodplain wetlands		x	x		x	
Shaded Riverine		x	x	x	x	x
Saline Tidal/emergent	x					
Mid-channel islands		x				

Table 2. Geographic Distribution of Priority Species Likely Actions to Address								
	North Bay	Delta	Sacramento	American	Feather/Yuba	smaller tributaries	San Joaquin	San Joaquin Tributaries
San Joaquin Fall Run		x					x	x
Winter Run		x	x					
Spring Run		x	x		x	x		
delta smelt	x	x						
splittail	x	x	x					
steelhead		x	x	x	x			
green sturgeon	x	x						
striped bass	x	x	x					x

VII. CRITERIA

In addition to the priority species and habitats, criteria have been identified to address technical and policy objectives. These criteria are summarized in Table 3. They will be used to guide selection of actions to address the priority species and habitats.

Table 3. Draft Criteria List for Selection of Restoration Actions

1.	Restoration actions should not prejudice the selection of alternatives in CALFED's Programmatic EIR/EIS.
2.	Restoration actions should be consistent with CALFED mission, goals, and objectives.
3.	Restoration actions should be amenable to evaluation and documentation of effects.
4.	Restoration actions should emphasize restoration of natural processes where possible.
5.	Restoration actions should be consistent with the CALFED solution principles.
6.	Restoration actions which provide long-term benefits should be emphasized over actions which provide short-term benefits.
7.	Restoration actions that also address the other CALFED program objectives for the Bay-Delta should receive the highest priority.
8.	Restoration actions which benefit a suite of species that includes listed species should be emphasized over actions that benefit any single species.
9.	Restoration actions should focus on eliminating or reducing limiting factors for listed species as well as on using natural processes to restore ecosystem function.
10.	Restoration actions for one species should not compromise another species.
11.	Demonstration projects should be emphasized to deal with uncertainty associated with restoration of ecosystem processes.